Discussion Papers

1 Planning for Special Waste Management

2 Selecting a Special Waste Storage Site: Criteria

3 Choosing the Special Waste Storage Site

4 The Special Waste Facility: Administrative and Cost Structure

5 Managing Yukon Garbage

The Special Waste Facility: Administrative and Cost Structure

Yukon
Waste Management
Program

May 1991

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Yukon
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Letter from the Committee Chair

May 1991

The Advisory Committee has been working for the past 16 months to establish a total Waste Management Program. We have identified what wastes we generate and have embarked on programs to improve the handling and treatment of these wastes. We have also implemented a public information process so that the general public can better understand what special waste is and how it can be dealt with responsibly. Criteria have been developed for siting a storage facility, and numerous sites identified by the public and our committee have been studied. In order to make an intelligent choice in siting a special waste storage facility you must first know how it will be used and what infrastructures will be in place to support it.

This paper presents that information. There are no easy answers, but we feel this paper presents options which will lead to the safe management of our Special Waste.

I would suggest you consult Paper #3, CHOOSING THE SPECIAL WASTE STORAGE SITE, when reading this paper. We have conceptually designed a facility which can grow, or reduce, with the needs of the territory. Reduction of special waste is our goal for the future but development of new industry in the Yukon may create a demand for additional storage. This design can meet those needs.

We have tried to anticipate all requirements, but ask that you review our plans carefully to ensure they meet your expectations for a safe, efficient and accessible facility.

It is now generally accepted that we can no longer dispose of special waste into the environment. We now must choose a facility and site which will provide maximum benefit at an affordable cost. A facility which is not safe, efficient and accessible, will not serve Yukoners' concerns for a healthier environment.

We look forward to your comments as we go through the public process. Together we can develop a system which will be acceptable to all of us.

Ione Christensen

Chair, Advisory Committee on Waste Management

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INTRODUCTION

This discussion paper is fourth in a series of five discussion papers aimed at developing a waste management system in the Yukon. Discussions in the first two papers defined special waste as waste which requires special treatment for safe disposal, and developed criteria for siting a special waste storage facility. Paper #3, CHOOSING THE SPECIAL WASTE STORAGE SITE, recommends options for siting the special waste facility based on work by the Site Selection Working Group. Paper #5, MANAGING YUKON GARBAGE, will deal with solid wastes and how they may be managed in concert with special wastes.

This paper discusses the administrative and cost structure of options for the collection, storage and disposal of special waste. It should be kept in mind that this is one part of an overall waste management strategy and that solid and special waste management should be integrated to allow the optimum use of all resources.

Some factors will be assumed for the purpose of this discussion paper. These factors will be discussed during public meetings and final determinations will be based on public input.

SPECIAL WASTES BACKGROUND

The report CHARACTERIZATION OF HAZARDOUS WASTE GENERATION AND DISPOSAL IN THE YUKON (February 1990) details the estimated 1000 tonnes of special waste produced annually, not including accident cleanup and existing stored wastes. Approximately 70 per cent of the waste is used oil. Segregating the used oil and managing it separately leaves 318 tonnes of special waste from 13 different waste categories.

To develop a waste management system suited to the Yukon we first must have an idea of how much waste this system should be able to handle. Practical experience indicates that a 75 per cent reduction, from amounts of waste reported, can be achieved by incorporating proper waste management. The Alberta Special Waste Management system in fact estimated an 82.5 per cent reduction of the reported wastes before entering their facility. The CHARACTERIZATION report suggests 67 per cent of Yukon reported wastes could be disposed of in secure landfill. Although these reductions should not be expected without proper education and incentives, reduction in industrial wastes should occur due to regulation and disposal costs.

While it is difficult to say what percentage of waste reduction will be achieved before regulations are in place, 50 per cent (leaving 160 tonnes annual production) should be a reasonable target on which to base the facility.

There is now a backlog of special waste awaiting disposal. This material should be dealt with through the facility in the first year or two of operation, after which the quantities should decrease.

The quantities we now produce lend themselves to storage and removal for disposal outside the territory. While it may be possible to neutralize some waste and take advantage of programs such as waste exchanges, disposal within the territory is **not** considered a viable alternative. The Goose Bay, Labrador incineration project which employed a mobile incinerator to destroy 3,500 tonnes of contaminated soil, oil and transformers, is estimated to have cost $15 million. The Swan Hills, Alberta facility which destroys 15,000 tonnes annually was built at a cost of $50 million in 1987 dollars. With an estimated waste stream of 160 tonnes annually, such a facility here would sit idle most of the time.

While shipping special wastes to facilities in other jurisdictions will subject the territory to additional regulations, economically it is a more desirable solution.

The following key issues and objectives must be kept in mind to provide for the needs of all Yukon residents and business, without causing economic hardship or discouraging development.

Key issues

- environmental protection and public health is of paramount concern
- there must be capability to handle all special wastes (other than biomedical, radioactive and explosive)
- source reduction must be employed to avoid handling and transporting large quantities of waste
- neutralization and disposal of some waste may be possible
- wastes received will have to be transported outside the territory
- legislation will be necessary to promote proper disposal methods
- the "polluter pay principle" should be employed
- volumes generated are probably not sufficient to support a business based solely on special waste.

Objectives

- address public concern for environmental and health protection through:
  - incorporation of proper facility design (containment, segregation and monitoring)
  - utilization of location to enhance safety and promote public scrutiny and use
  - incorporating security mechanisms (fences, electronic surveillance)

- cost effectiveness and recognition of regional disparities such as distance from facilities, and how to compensate through:
  - options to enhance economy of collection and transportation
  - use of transport subsidies
  - solutions which address concerns of remote locations
- accountability of operations – allowing for public scrutiny
- revenue generation – providing incentives for reduction
- ownership and liability of facility and wastes.

Key questions

- Should government pay for household special waste?
- Should industry pay 100 per cent of disposal costs for wastes it generates?
- Should transportation costs be subsidized?
- How should "Environmental Funds" be established?
- What "pre-disposal fees" should be placed on items which produce special waste?

Legal framework

Any facility will have to be established within the existing and proposed legal framework, as outlined below.

Legal framework

Legislation	Requirements
Transport of Dangerous Goods Regulations	• training of individuals • packaging requirements • documentation for tracking waste • vehicle identification
Workplace Hazardous Materials Information System	• ensuring worker safety • information sheets on each substance • identifying protective gear
Building and Fire Codes	• design and construction safety standards
Yukon Environment Act (proposed)	• regulating of waste generators • disposing of wastes properly

A territorial storage facility is one of the features considered essential to enable optimum management of waste material both from an economical and environmental point of view. This would provide a location to properly store the waste until sufficient amounts were accumulated to allow the optimum use of safe and economical transport.

In collecting the special waste one of the problems will be small quantities generated over a large area. Two scenarios should be considered. One scenario is that of locating the territorial storage facility in or near Whitehorse, thereby locating it nearest to generators of the largest volume of special wastes. It would then be expected that generators in Whitehorse would transport wastes directly to the territorial storage facility. Wastes generated outside of the Whitehorse area would either have to be transported to Whitehorse at the expense of the generator, or would have to be collected and transported by a mechanism operated separately from the generators. For wastes generated outside Whitehorse, facility options to consider are:

- interim storage site;
- community collection;
- a combination of interim storage and community collection;
- private enterprise collects and transports to the territorial storage facility.

The second scenario is that the territorial storage facility be located outside the Whitehorse area. This would mean that special waste from the Whitehorse area would have to be collected and transported to this facility in a fashion similar to special wastes from other communities. The facility options would be the same as in the first scenario, except that Whitehorse would now have to consider the options for an interim storage site.

By starting with a territorial storage facility and building interim storage in locations where interest is expressed in having a local site, community collection could then be used to cover areas without access to a local facility. Community collection could be the minimum level of service. Interim storage or other enhanced levels of service could be established on a cost share basis with interested communities. The timing of community collection would be flexible until experience is gained to allow scheduling.

Options

A **territorial storage facility** on its own would mean that wastes would be transported to the facility either at the expense of the generator or the authority responsible for waste management. Generators who were located at a distance may be disadvantaged in terms of delivering waste to the facility.

Interim storage would provide a locally accessible controlled storage option for generators of small quantities of waste, such as households and small business. Generators of large quantities of waste may still be required to transport directly to the territorial storage facility if the quantities warrant. Interim storage could be located in areas with a good potential for collecting waste from more than one community, or in areas where waste management could be facilitated by having interim storage, however, interim storage may not suit every community.

Community collection would provide a mechanism for the collection of waste from communities on a routine basis. This would mean that householders and small business would store special waste until the next available community collection day. Wastes would be collected at an easily accessible location and immediately loaded on vehicles for transport.

A **combination** of the previous options may be the most practical. No one system will suit all situations, so to ensure that the best possible solution is found for each region or community, it would be advantageous to remain flexible in designing the overall special waste management plan.

Private enterprise could play a role in collecting the waste material and providing transportation to the territorial storage facility. This option could be used for community collection and in combination with other options.

TRANSPORT

The transport aspect of the special waste program must be capable of transporting wastes from throughout the Yukon to the territorial storage facility. Depending on the collection systems established, this could include transport from interim storage sites and wastes collected during community special waste collection days. Some waste generators may produce waste in quantities which would require them to assume responsibility for delivery of their waste to the territorial storage facility.

Options

Contractors could collect from interim storage facilities as required. This could be combined with community collections to ensure the best use of resources, and to avoid large quantities of waste arriving at the territorial storage facility at one time.

Collection from communities and interim storage sites could be arranged on an **individual basis** to take advantage of backhaul rates or other transport economies.

Depending on quantities generated, industry could be required to transport waste generated to the territorial storage facility or an interim facility. This would require development of a very clear policy to ensure the generator would know the criteria used to determine their responsibility for getting waste to a facility.

Transportation to the territorial storage facility may have to be subsidized, depending on distance and volume of waste.

Regardless of the type of administrative agency there are certain functions which should be expected. Achieving these will depend on resources and desired public participation. To ensure a high level of public information and scrutiny there should be annual reports to identify the sources of income and expenditures, the amounts of waste handled and the costs per unit of waste.

The facility could also act as a contact point for waste exchanges and in the promoting of the 4 Rs of waste minimization. While waste minimization will be advantageous to industry from an economic point of view, the incentives to incorporate the 4 Rs and to participate in programs such as waste exchanges should still be promoted through the waste management facility.

The management of the facility would be responsible for the coordination of collection and disposal of special waste from all of the Yukon, although interim facilities could manage this aspect for the area they serve.

Some of the facility requirements, in addition to the storage capability, include access to a lab for analyzing the waste to ensure proper classification, and to identify unknown wastes which may be submitted by individuals or from cleanups of "abandoned" sites. Presently the required lab facilities are not available in either the public or private sector in the Yukon. It is anticipated that if the facility was located outside the Whitehorse area, lab cost would be substantially higher, due in part to sample transport costs.

The facility must also have specialized equipment available for emergency response. This could be coordinated with other response agencies so the equipment would be available in the event of an emergency outside of the facility. Once again, locating in an area without full time emergency services would increase both capital and operation and maintenance costs.

Options

There are various methods of administering the waste management program and even more combinations of ownership and management of facilities, land and wastes collected. In dealing first with the administration of the waste management program, this could be handled by:

- contract with a private company
- crown corporation
- government department.

Based on quantities to be dealt with (approximately 160 tonnes annually) it would seem appropriate that special waste be part of an existing operation and not the only work conducted. Contracting to **private industry** or an operation which is already established would enable special waste activities to supplement other established (profitable) business activities.

The management of the facility could be handled by a **crown corporation**. Based on the quantities generated it may be more appropriate to expand the responsibilities of an existing corporation rather than create a new one. This would allow for the best use of available expertise while allowing for special waste to consist of a part-time aspect of the operation.

Government could operate the facility or simply play a role in overseeing the operation of the program and ensuring the best available technology is used. It could oversee the contracting of the special waste program, provide technical assistance to industry in complying with regulatory requirements and promote the 4 Rs of waste minimization.

An **administration board** could be established to oversee the operation. This board could participate in the decision-making processes and provide for public scrutiny through published reports. With proper representation this could provide a mechanism to coordinate with other waste management programs.

It is anticipated that the territorial storage facility and land would be the property of the Yukon Government. Ownership of the waste would depend on the administrative structure.

The costs associated with establishing and running the program can be divided into three areas:

- facility design, location and construction;
- transportation of waste to the territorial storage facility
- operation and maintenance of the facility(s) including disposal.

Special waste facility construction cost estimates	
main building	$300,000
4 pads for storage containers	$150,000
12 portable storage containers	$250,000
access road and internal roads	$100,000
services, site evaluation and miscellanea	$150,000
Total	**$950,000**

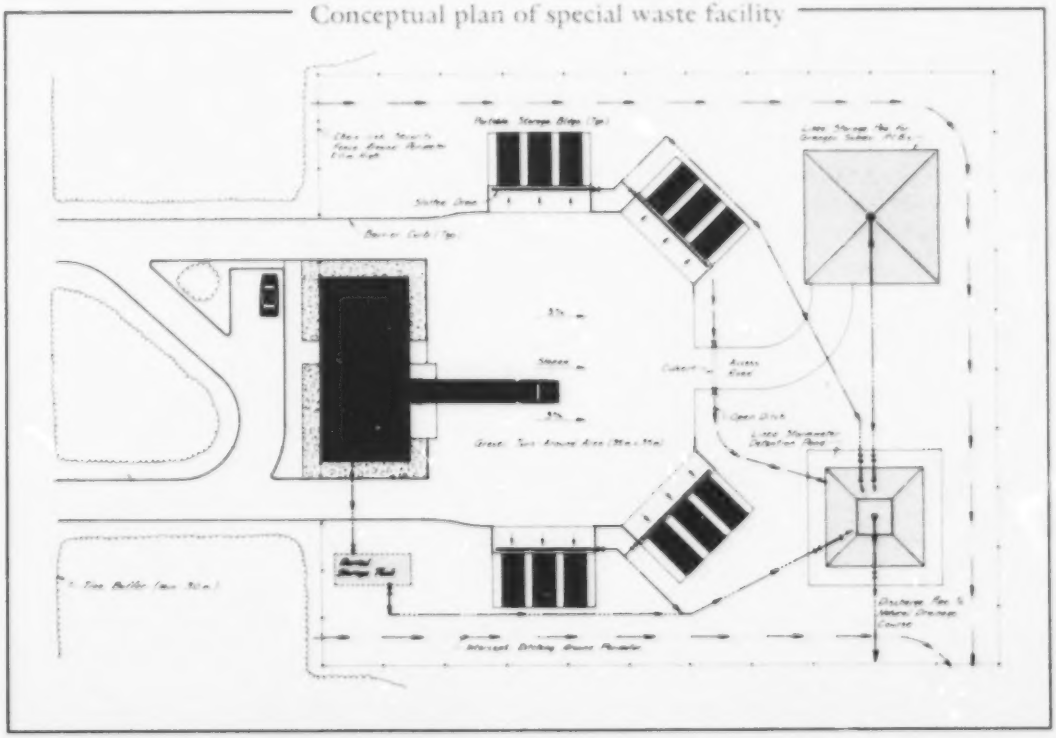
Capital

The costs associated with the territorial storage facility **design, location and construction** will depend on the outcome of the siting process. Modifications may have to be made in the design to compensate for site characteristics. The basic design being considered is shown below. Assuming that the land chosen will be available at a reasonable cost, if it is not already owned by the Yukon government, the facility itself is expected to cost approximately $1,000,000. This is based on the following estimates.

The cost of interim storage facilities would vary depending on the storage requirements of the community. If portable units similar to those proposed for the territorial facility were used, the cost would be about $35,000 per unit. Security mechanisms such as fences and alarms would add to this cost.

If the territorial storage facility was located outside the Whitehorse area there may be additional costs incurred in construction, road upgrading, providing emergency response capability and providing services to the site. This may also require the establishment of an interim

Conceptual plan of special waste facility



storage facility in Whitehorse, which could add as much as $750,000. Additional costs would also be incurred in the collection and transport of special waste from the Whitehorse area. This includes 118.5 tonnes of special waste annually, of which 18.5 tonnes is household special waste.

Transportation

The **transportation** costs for delivering waste to the territorial storage facility, both inside and outside the Whitehorse area, has been calculated for the estimated volumes of wastes generated in each region annually.

Transportation cost estimates		
	Whitehorse	Site outside Whitehorse*
Northern	$1,300	$1,300
Eastern	$2,000	$2,000
Western	$700	$700
Whitehorse	$ –	$7,700
Total	**$4,000**	**$11,700**

* Depending on facility location, transport costs may vary.

Operation and maintenance

The **operation and maintenance** of the facility or facilities (may include interim storage facilities) is a somewhat more uncertain estimate. Depending on the number of interim storage facilities that are required and the amount that disposal is subsidized, this could vary considerably.

Some of the **assumptions** that will be used for the purpose of this estimate are as follows:

- disposal costs for household special waste will be subsidized.
- disposal costs for industrial waste will not be subsidized.
- transportation costs have been subsidized by 50 per cent.
- interim facilities have not been included in these costs.

Annual operating cost of special waste facility		
	Whitehorse	Site outside Whitehorse
Facility O&M	$60,000	$70,000
Testing unknowns ($.32/kg x 26,500kg)	$8,500	$10,000
Disposal household special wastes (26,500 kg. @ $2000/tonne)	$53,000	$53,000
Transport subsidies	$2,000	$6,000
Total	**$123,500**	**$139,000**

FUNDING

A number of funding options are available. We must not forget in our cost/benefit analysis that there are many hidden savings which may be long term in nature. In funding proper waste management through mechanisms such as Predisposal Fees or Deposit and Refund programs, it should be pointed out that benefits fall on more than just specific items. Extending the life of existing landfill sites, reducing costs for sewage treatment and avoiding future clean-ups are a few examples.

Paying part of the costs to deal with waste at the time of purchase ensures funding is available for disposal. This can be accomplished through a dedicated fund which only deals with money for waste management, referred to as a "Revolving Fund". The money that enters this fund could be from specific sources such as: products that require special handling at disposal or materials which lend themselves to recycling. The money could be used to offset disposal costs or in assisting other waste management programs.

In determining funding options it has been assumed that industry and government would pay the disposal costs for wastes generated through their operations. Wastes generated by individual households would be covered through funding from the Revolving Fund and/or government subsidies.

The report FUNDING SPECIAL WASTE MANAGEMENT IN THE YUKON (November 1990) details the options for revenue generation by various deposits and disposal fee schemes. This report estimates that $100,000 could be generated annually from products which require special disposal. This estimate is based on:

Tires
($5 x 12,000) $60,000

Batteries
($5 x 2,000) $10,000

Special wastes, excluding oil
($0.30 x 100,000 kg) $30,000

This does not allow for the administrative costs to collect this revenue.

The report suggests that options for revenue generation can be a single system or a combination and that it may be best to start with a simple system and build on it as experience is gained. Some of the options presented for consideration are:

- user fees for industrial generators
- predisposal fees on specific products
- deposit and refund
- specialized waste disposal fund from general revenues
- combination of options.

The development and administration of these options is not complex and could be established under the Yukon Environment Act. By establishing a revolving fund, money collected could be used strictly for waste management issues.

HOW YOU CAN BECOME INVOLVED

There are several ways that you can participate in the determination of the cost and administrative structure of the special waste management system. These include participation in the open houses and public meetings which will be held in the communities.

You can invite the Advisory Committee to speak to your community group, or phone or write the Waste Management Coordinator with your ideas.

The proposals put forth in this paper are meant to stimulate discussion. You are encouraged to comment and make recommendations. Your contribution is important in developing the best waste management solution for the Yukon.

You can discuss any detail of this or any other paper, or request more detailed information, by contacting:

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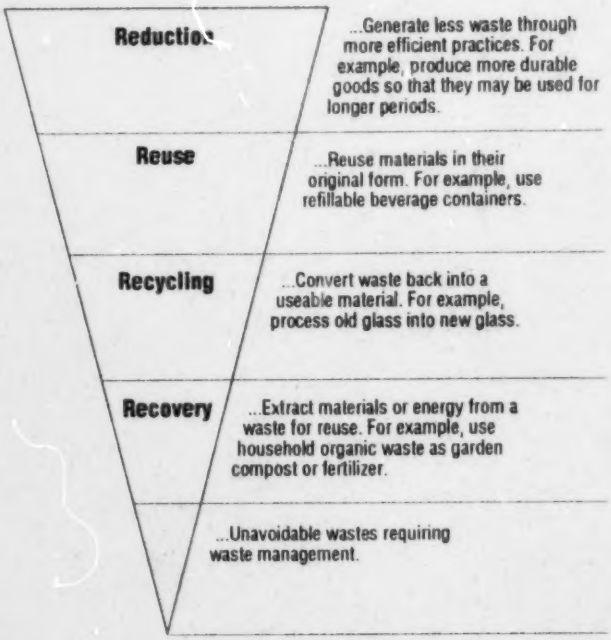
THE FUNDAMENTAL PRINCIPLES OF THE YUKON'S WASTE MANAGEMENT PROGRAM

The Government of the Yukon has made a major commitment to develop a comprehensive waste management program. The development of the program will be guided by the Advisory Committee on Waste Management which represents both public and private interests.

The overriding goal for the waste management program is to ensure public and environmental health and safety. The fundamental principles include:

1. Minimizing waste production by incorporating the 4 Rs of sound waste management...


Reduction
...Generate less waste through more efficient practices. For example, produce more durable goods so that they may be used for longer periods.
Reuse
...Reuse materials in their original form. For example, use refillable beverage containers.
Recycling
...Convert waste back into a useable material. For example, process old glass into new glass.
Recovery
...Extract materials or energy from a waste for reuse. For example, use household organic waste as garden compost or fertilizer.
...Unavoidable wastes requiring waste management.

2. Developing a waste management system to include handling, transportation, storage and disposal of waste in a manner consistent with the overall goal of ensuring public and environmental health and safety standards.
3. Providing a public education and information program that addresses all aspects of waste management.
4. Enabling full public participation at all key stages of the program development.
5. Encouraging and supporting sustainable economic development through a cost-effective waste management system.

The Committee's first priority is to develop a special, or hazardous waste management program, after which the Committee will work on a solid waste management program.

Yukon
Community and Transportation Services
Maurice Byblow, Minister

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